Rejection under 35 U.S.C. §101

The Office Action rejects Claims 31-44 under 35 U.S.C. § 101 for the reasons of record. In particular, the Office Action asserts:

> There is no doubt that certain receptor tyrosine kinase genes are causally associated with certain types of cancers. However, there is no evidence that the receptor tyrosine kinase of the instant invention is associated in any way with any particular type of cancer of with cancers in general.

Applicants respectfully traverse the rejection.

Applicants respectfully submit that the present disclosure provides a specific, substantial and credible utility for the claimed invention. In particular, on pages 95-96 of the specification, the expression of HPTK6 was characterized by Northern blot hybridization of polyadenylated RNA isolated from human tissues. In the human adult tissues, the highest amount of hybridization was detected in samples of RNA from the kidney and placenta (see page 95, lines 26-28). Lower expression was observed in the brain, lung, skeletal muscle, and pancreas (see page 95, lines 28-30). However, no expression in the liver was detected (see page 95, line 30 and Figure 10A). Similar results were obtained in fetal human tissue, as is evidenced in Figure 10B. The highest expression was observed in the fetal brain with lower expression in the fetal kidney and lung tissue (see page 95, line 33 to page 96, line 1). As in the adult tissue, no expression in the liver was detected (see page 96, lines 3-4). Expression of HPTK6 in various cell lines was also studied via Northern blotting of mRNA samples from the cell lines. As shown in Table 3 of page 96, in lines 27-28, a moderate to weak detection of HPTK6 was found in Hep 3B cells, a liver carcinoma. Thus, it is clear that there is a substantial, credible, and specific utility for HPTK6, namely the detection and treatment of liver cancer by HPTK6 by using HPTK6 antibodies, antisense, etc. In addition, Applicants respectfully note that HPTK6 is also expressed

in breast carcinoma cells (e.g., MCF 7), thereby indicating a possible detection and treatment of breast cancer as well. (See page 96, lines 20-22).

Thus, based on the disclosure in the specification, it is clear that the isolated nucleic acid molecules encoding an HPTK6 receptor such as the nucleic acid molecules claimed in the present application have a credible, substantial, and specific utility. Accordingly, reconsideration and withdrawal of the rejection of Claims 31-44 under 35 U.S.C. §101 are respectfully requested.

Rejection under 35 U.S.C. §112, first paragraph

The Office Action again rejects Claims 31-44 under 35 U.S.C. §112, first paragraph as failing to adequately teach how to use the instant invention for those reasons given in the rejection under 35 U.S.C. §101 set forth above.

Applicants respectfully traverse the rejection.

A deficiency under 35 U.S.C. §101 also creates a deficiency under 35 U.S.C. §112, first paragraph. In re Brana, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995); In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967). Thus, in order to be enabled, a claim must be supported by a disclosure showing practical utility. As discussed above, the present disclosure provides a specific, substantial and credible utility for the claimed invention. Thus, the claimed invention meets the requirements of 35 U.S.C. §112, first paragraph. Reconsideration and withdrawal of the rejection of Claims 31-44 under 35 U.S.C. §112, first paragraph, is therefore respectfully requested.

Rejections under 35 U.S.C. §102(a)

Claims 31-44 are rejected under 35 U.S.C. §102(a) as being clearly anticipated by Johnson et al. (PNAS 90:5677-5681, Jun. 1993). Additionally, Claims 31-33, 35-38, and 40-44 are rejected under 35 U.S.C. §102(a) as being clearly anticipated by Di Marco (J. Biol. Chem. 268:24290-24295, 15 Nov. 1993). In particular, the Examiner has asserted that the Declaration filed on May 1, 2000 under 37 C.F.R. §1.131 is ineffective to overcome the Johnson et al. and DiMarco references because the Declaration fails to show that Applicants had established a practical utility for a receptor protein tyrosine kinase of the instant invention or an isolated nucleic acid encoding such a receptor prior to the publication of these references.

In response, Applicants submit that the Declaration clearly demonstrates conception and reduction to practice of the claimed subject matter prior to the effective filing date of Johnson (June, 1993) and DiMarco (Nov., 1993). Further, as discussed above, the present disclosure provides a specific, substantial, and credible utility for the claimed invention. Therefore, Applicants request full and favorable consideration of Declaration under 35 U.S.C. §1.131 filed on May 1, 2000.

In view of the above, Applicants submit that the isolated nucleic acid encoding a receptor claimed in Claims 31 and 36 had a specific, substantial, and credible utility before 1993 and that neither Johnson nor DiMarco are effective prior art references. Therefore, Applicants respectfully request that these rejections be reconsidered and withdrawn.

Rejection under 35 U.S.C. §102(b)

Claims 41-44 are rejected under 35 U.S.C. §102(b) as being anticipated by Klein et al. (EMBO J. 8(12):3701-3709, 1989). In particular, the Examiner asserts that "because any oligo

will bind to any nucleic acid under the appropriate conditions, these claims encompass any oligonucleotide." The Examiner also asserts that "since all nucleic acid molecules will bind (hybridize) to one another under certain conditions the oligonucleotide which was employed in Figure 1 of Klein et al. would certainly bind to the nucleic acid molecule of any of Claims 41-44 under the appropriate conditions.

Applicants respectfully traverse this rejection.

Initially, Applicants note that the Examiner is using the sequence of a mouse trkb (i.e., Figure 1) to obviate a human sequence as in the present invention. Additionally, Claim 41 claims an isolated nucleic acid that will hybridize under stringent conditions, such as those conditions described in the specification on page 19, lines 7-18. Although non-homologous nucleic acids will hybridize under non-stringent conditions, only homologous nucleic acids will hybridize under stringent conditions. As shown in the attached sequence alignments, SEQ ID NO: 7 has an 18.68% homology with mouse trkb and SEQ ID NO: 3 has a 43.98% homology with mouse trkb, and both sequence alignments have many gaps in which there is no homology at all. These factors indicate a very poor case for hybridization of mouse trkb with SEQ ID NO: 7 and SEQ ID NO: 3 under stringent conditions. Thus, there would be no appreciable binding of trkb to the nucleic acid of the present invention, which requires stringent conditions for hybridization. Accordingly, the mouse trkb sequence of Klein et al. is not sufficiently homologous to the nucleic acid sequences claimed in the present invention, and cannot support a rejection under §102.

Because a reference must contain each and every element of the claimed invention within the four corners of the document for the reference to be anticipatory, and because Klein et al. do not disclose an isolated nucleic acid sequence as set forth in any one of Claims 41-44, Applicants

submit that the present invention is not anticipated by, or obvious over, Klein et al. and respectfully request that the Examiner reconsider and withdraw this rejection.

CONCLUSION

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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12/21/01
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